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54 A cosmetic composition.

57 A cosmetic composition comprises a compound capable of generating heat to raise the temperature of the composition when the compound is brought into contact with water.

The cosmetic composition is used for hair shampoo, hair rinse, hair lotion, hair treatment, hand cleaner, hand lotion, cleansing lotion and moisturizing cream.

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1 TITLE OF THE INVENTION

A Cosmetic Composition

BACKGROUND OF THE INVENTION

5 Field of the Invention

This invention relates to a cosmetic composition. More particularly, the present invention relates to a cosmetic composition which generates adequate heat when it is used.

Description of the Prior Art

10 As cosmetic compositions which are usable for hair washing such as shampoo or rinse, for hair such as rinse (conditioner), lotion or hair treatment, and for skin such as hand cleaner or hand cream are cited, and they contain soap and surface active agents as main components, and also
15 conditioners such as oily components, perfumes, dyes, thickeners or cationated celluloses, protein derivatives, lanolin derivatives and extracts of natural substance.

Further conditioning cosmetic compositions for hair may contain oily components such as vegetable oil, fatty acid
20 ester, higher alcohol, etc., surface active agents, oil soluble poly(alkylene oxides) derivatives, lanolin derivatives, vegetable components, etc., as main components and also perfumes, dyes, thickeners, etc.

A cosmetic composition shows its finishing effect
25 when it is used with water, and its cleansing effect and

21

1 finishing effect are enhanced and more comfortable hot feeling
is given when it is used with hot water than when it is used
with cold water. But it cannot be said that hot water is
always arranged.

5 As conditioning cosmetic compositions for hair, hair
washing type rinse, lotion, treatment, etc. may be cited,
and their cosmetic effect are shown when they are used with
water. In this case, finishing effect is better and more
comfortable hot feeling is given when hot water is used rather
10 than when cold water is used. But, it cannot be said that
hot water is always arranged.

The inventors of this patent repeated investigations
under above circumstance with the object to get a cosmetic
composition showing both excellent cleansing effect and
15 excellent finishing effect even if it was used with cold water
and then recognized that the object could be easily achieved
if such substance that reacts with water to generate heat is
used in cosmetic. Therefore, this invention is based on this
recognition.

20 SUMMARY OF THE INVENTION

It is an object of the present invention to provide
a cosmetic composition showing excellent cleansing effect
even if it was used with cold water.

25 It is another object of the present invention to

1 provide a cosmetic composition showing excellent finishing
effect even if it was used with cold water.

It is a further object of the present invention to
provide a cosmetic composition for hair showing excellent
5 finishing effect even if cold water was used.

According to one aspect of the present invention,
there is provided a cosmetic composition which comprises a
compound capable of generating heat to raise the temperature
of the composition when the compound is brought into contact
10 with water.

According to another aspect of the present invention,
there is provided a cosmetic composition comprising a member
selected from the group consisting of poly(ethylene oxides),
poly(propylene oxides) and derivatives thereof and a member
15 of alkylene glycols having 2 to 9 carbon atoms are contained
as the compound.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A feature of the present invention is to contain such
20 substance which generates heat when it is contacted with water
in a cosmetic composition such as hair shampoo, hair rinse,
lotion, hair treatment, hand cleaner, etc.

The expression "cosmetic composition" as used in the
present invention comprehends a cosmetic composition usable
25 for hair washing, hair treatment, skin, etc. as mentioned above,

1 and the cosmetic composition contains the same components as
a conventional general composition. That is, the composition
contains soap and/or surface active agents as main components,
also perfume, dye, thickner, conditioner, etc. but hydroxy-
5 propyl cellulose is particularly used in the present invention
suitably as a thickner.

The present invention comprises containing substance
which generates heat of dilution, heat of dissolution, or
heat of reaction when it is contacted with water. If the
10 quantity of generated heat is too small, the merit of the
present invention cannot be achieved, and if the quantity of
generated heat is too large, the composition becomes dangerous
and cannot be used safely on the contrary. Generally, such
substance is used which raise the temperature thereof up to
15 three or more degrees, preferably up to five or more degrees
and further more preferably up to eight or more degrees when
the said composition is mixed with cold water in an equal
weight ratio. And such substance which raises the temperature
thereof up to twenty or more degrees and particularly, up
20 to thirty or more degrees is not preferable in view of
safety.

Examples of the substances used in the present
invention which generate heat when it is contacted with water
are as follows. Alkyl alcohols having 2 to 4 carbon atoms
25 such as ethanol, isopropyl alcohol and the like; alkylene

5

1 glycols having 2 to 9 carbon atoms such as ethylene glycol,
propylene glycol, butylene glycol, pentylene glycol, hexylene
glycol and the like; aliphatic triols such as glycerol;
di(alkylene glycols) and derivatives thereof having 2 to 4
5 carbon atoms in the alkylene portion such as di(ethylene
glycol), di(propylene glycol), di(ethylene glycol) mono methyl
ether, and di(ethylene glycol) mono ethyl ether; and poly
(alkylene oxides) (also called poly(oxyalkylene), poly(alkylene
glycol), or polyether glycol) and derivatives thereof having 2
10 to 4 carbon atoms in the alkylene portion such as poly(ethylene
glycols), poly(propylene glycols), block or random copolymers
of ethylene oxide and propylene oxide, and others of poly
(alkylene oxides) having 1 to 5 carbon atoms in the ether
portion, for example, butyl mono ethers of copolymers of
15 ethylene oxide and propylene oxide, butyl mono ethers of
poly(ethylene oxides), poly(ethylene oxide-propylene oxide)
adducts of glycerol, and poly(propylene oxides) adducts of
glycerol.

20 As said alkyl alcohols, it is preferable to use
ethanol or isopyl alcohol.

As alkylene glycols having 2 to 9 carbon atoms, alkylene
glycol having 6 or less carbon atoms per molecule can be
preferably used. But, alkylene glycol having 10 or more carbon
atoms per molecule cannot be used in the present invention.
25 It is more preferable to use ethylene glycol, propylene glycol,

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1 or hexylene glycol.

As said aliphatic triols, it is preferable to use glycerol.

5 As said di(alkylene glycols), it is preferable to use di(ethylene glycol) or di(propylene glycol). As said derivatives thereof, it is preferable to use di(ethylene glycol) mono methyl ether or di(ethylene glycol) mono ethyl ether.

10 As said poly(alkylene oxides), it is preferable to use poly(ethylene glycol)-200, -300, -400, and -600 (said figures represent average molecular weight of the poly(ethylene glycol)), poly(propylene glycols) having 200 to 1200 of average molecular weight or block copolymers of ethylene oxide and propylene oxide.

15 As said derivatives of said poly(alkylene oxides), it is preferable to use mono butyl ethers of copolymers of ethylene oxide and propylene oxide, poly(ethylene oxide - propylene oxide) adducts of glycerol or poly(propylene oxides) adducts of glycerol.

20 The present inventors studies widely with the object to obtain such conditioning cosmetic composition for hair showing excellent finishing effect even if cold water was used, and, as the result, they realized a method to use polyalkylene oxides or their derivatives which generated heat when they were contacted with water.

25 However, poly(alkylene oxides) or derivatives thereof

1 change to oil soluble from water soluble as the number of
carbon atoms in alkylene portion increase, and so poly(ethylene
oxides), poly(propylene oxides) or derivatives thereof only
can actually be used among poly(alkylene oxides) or their
5 derivatives. On the other hand, since a conditioning cosmetic
composition for hair contains oily components such as vegetable
oil, mineral oil, fatty acid ester, higher alcohol, oily
poly(alkylene oxides) derivatives, that are, for examples,
poly(propylene oxides) butylether, poly(propylene glycols), etc.,
10 such inconvenience will be resulted that the oily components
become insoluble if water soluble poly(ethylene oxides),
poly(propylene oxides) or derivatives thereof are used as heat
generating components.

15 The inventors of this invention studied further about
this problem and recognized unexpectedly that this problem
could be solved easily by using poly(ethylene oxides), poly
(propylene oxides) or derivatives thereof along with alkylene
glycol having 2 to 9 carbon atoms, which make oil soluble and
they completed the present invention.

20 The substance which generates heat is generally
employed in an amount more than 50% by weight and preferably
in an amount more than 60% by weight of the total cosmetic
composition. If the ratio of the said substance in the
cosmetic composition increases, accordingly the ratio of
25 cleaner decreases, and, generally, the said substance is

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1 employed in an amount under 95% by weight, further preferably
in an amount under 80% by weight, and more preferably in an
amount of 70% by weight or more based on the total cosmetic
composition. If the amount is less than 50% by weight,
5 satisfactory heat generating effect is not achieved.

It is preferable that the cosmetic composition for
hair according to the present invention contains both poly
(ethylene oxides), poly(propylene oxides) or derivatives
thereof which generate heat on contact with water and also
10 alkylene glycol having 2 to 9 carbon atoms.

In case of the cosmetic composition for hair, an amount
of poly(ethylene oxides), poly(propylene oxides) or derivatives
thereof used in this invention is generally 50% by weight or
more, preferably, 60% by weight or more, and further preferably
15 70% by weight or more of the total cosmetic composition. If
the amount is less than 50% by weight, satisfactory heat
generating effect cannot be achieved. If the amount is too
large, the ratio of the essential cosmetic component decreases,
and, generally, they are employed in an amount 90% by weight
20 or less and preferably in an amount 80% by weight or less of
the said cosmetic composition. Alkylene glycol having 2 to 9
carbon atoms is generally employed in 1.0 to 0.1 weight ratio
and preferably in 0.5 to 0.25 weight ratio to poly(ethylene
oxides), poly(propylene oxides) or derivatives thereof. Also,
25 hydroxypropyl cellulose is preferably used as a thickner

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1 in the cosmetic composition for hair of the present invention.

2 The cosmetic composition of the present invention can
3 be used to be mixed in a suitable ratio with cold water, and
4 the heat generated by mixing can be controlled by increase or
5 decrease in quantity of water. Foaming and permeability of
6 the cleaner are improved and more excellent cleaning effect
7 can be achieved by generation of heat even if cold water is
8 used. The composition of this invention can be used suitably
9 as a composition for hair since the composition can achieve
10 particularly well balanced oil/water finishes. And also, even
11 though a hair treatment on the market requires an operation of
12 hair steaming with a towel dipped in hot water, the hair treat-
13 ment of the present invention gives comfortable hot feeling
14 effect and steaming effect can be achieved since the hair
15 treatment generates heat and temperature increase can be
16 achieved by mixing with water existing between hairs after
17 shampoo.

18 The present invention will be described more concretely
19 by examples, but the present invention shall not be limited
20 to these examples unless exceeding the essential summary of
21 the present invention. In the following examples, all the
22 terms "part" denote part by weight, and every chemicals used in
23 the examples meets the Standard of the Raw Material for the
24 Cosmetic Composition unless especially stated.

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EXAMPLE 1

Poly(ethylene glycol)-400 (64.5 parts), 10 parts of monooleic acid poly(oxyethylene) sorbitan (20 mol of ethylene oxide), 15 parts of 2-alkyl-N-carboxyethyl-N-hydroxyethyl imidazolium betaine (Softazolin SF supplied by Kawaken-Fine Chemicals), 5 parts of coconut fatty acid diethanolamide, 5 parts of propylene glycol and 0.5 parts of perfume were uniformly mixed with agitation. An adequate quantity of the hair shampoo thus obtained was taken in a hand and then applied directly or after being diluted with water in an amount less than approximately one half quantity of the hair shampoo to hair and head skin which had been wetted with cold water or hot water to conduct the shampooing. As a result, comfortable hot feeling effect was achieved, and finishing effect was good.

EXAMPLE 2

Poly(ethylene glycol)-400 (59.0 parts), 3.0 parts of isopropyl myristate, 0.05 parts of L-menthol, 5.0 parts of hexyl decanol, 1.5 parts of hydroxypropyl cellulose, 1.0 part of hydrolyzed animal protein derivative (Promois E 118D supplied by Seiwa Kasei Co.), 2.0 parts of cetyl trimethyl ammonium chloride (Lepon TM 16 supplied by Sanyo Kasei Co.) and 13.0 parts of hexylene glycol were mixed with agitation. To the resulting mixture was added a solution of 0.005 parts of Orange 205 (dye approved by law) dissolved in 1.0 part of

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1 water. Then, a solution of 1.0 part of distearyl dimethyl
ammonium chloride dissolved in 12.9 parts of the above
mentioned hexylene glycol with heating at 60°C was further
added to obtain a hair treatment.

5 An adequate quantity of the hair treatment was taken
in a hand and diluted with cold water in an amount less than
about one half quantity of the hair treatment. The diluted
hair treatment was then applied to hair which has been rinsed
with the shampoo obtained in Example 1 and to head skin so as
10 to rub the hair treatment on them. As a result, hot feeling
was given and finishing effect was good.

EXAMPLE 3

Glycerol (30.0 parts), 55.0 parts of propylene glycol,
5.0 parts of 2-hexyl decanol, 5.0 parts of ethanol (99%),
15 1.0 part of cetyl acetate, 2.0 parts of silicone oil (Toray
Silicone SH 3771 oil supplied by Toray Silicone Co.), 2.0
parts of hydrolyzed animal protein derivative (Promoise E
118D supplied by Seiwa Kasei Co.), 0.0001 part of dyestuff
and 0.2 parts of perfume were successively mixed uniformly
20 to obtain a hand lotion in a liquid form.

An adequate quantity of the hand lotion was taken in
a hand, mixed with water in substantially the same amount as
that of the hand lotion uniformly and spread over the hand.
As a result, comfortable hot feeling was given due to heat
25 generation upon hydration of the lotion. Further, circulation

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1 of the blood was facilitated and simultaneously good balance
of the moisture content and oil content in the skin was
achieved so that the hand skin became smooth. Also, when
the propylene glycol was replaced by ethanol, similar results
5 were obtained.

EXAMPLE 4

Poly(ethylene glycol)-300 (30.0 parts), 30.0 parts
of poly(ethylene glycol)-400, 15.0 parts of poly(oxyethylene)
(20) monooleate, 15.0 parts of 2-alkyl-N-carboxyethyl-N-
hydroxyethyl imidazolium betain (Softazolin SF supplied by
Kawaken-Fine Chemicals), 5.0 parts of coconut fatty acid
diethanolamide, 0.5 parts of perfume, 0.5 parts of white
pigment (Natural Pearlescence AH-1 supplied by Kakuhachi Co.,
Ltd.) and 4.0 parts of poly(oxyethylene)-poly(oxypropylene)
15 block polymer (Pluronic L 61 supplied by BASF) were suc-
cessively mixed uniformly to obtain a liquid hand soap.

An adequate quantity of the hand soap was taken in a
hand and mixed with cold water in about equivalent amount to
that of the soap. The hand was then washed with the soap.
20 As a result, owing to heat generation upon hydration of the
soap, cold feeling due to the cold water was eliminated, and
circulation of the blood was improved, and further the
moisture content was well balanced so that the skin became
smooth.

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1 EXAMPLE 5

5 Poly(oxyethylene)-poly(oxypropylene) block polymer
(10.0 parts), 56.6 parts of propylene glycol, 20.0 parts of
ethanol, 5.0 parts of 2-alkyl-N-carboxyethyl-N-hydroxyethyl
imidazolinum betain (Softazolin SF supplied by Kawaken-Fine
Chemicals), 0.2 parts of isopropyl myristate, 0.2 parts of
2-hexyldecanol and 3.0 parts of poly(oxyethylene)(20) mono-
oleate were successively mixed uniformly to obtain a liquid
cleansing lotion.

10 An adequate quantity of the cleansing lotion was mixed
with water. Then, a cut cotton was wetted with the lotion and
used to wash off the make-up, and thereafter the face was
washed with water. As a result, owing to heat generation upon
hydration of the lotion, the activation was enhanced and the
15 cleansing effect was improved.

EXAMPLE 6

20 Propylene glycol (30.4 parts), 25.0 parts of ethanol,
5.0 parts of zinc chloride, 32.0 parts of poly(ethylene glycol)
-300, 5.0 parts of 2-hexyl decanol, 2.0 parts of hydrolyzed
animal protein derivative (Promois E 118 D supplied by Seiwa
Kasei Co.), 0.1 part of purified water and 0.5 parts of per-
fume were successively mixed uniformly to obtain a hot shower
oil in a liquid form.

25 Small portions of the product were taken in a hand,
applied to and spread over skin which had been wetted after

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1 shower. Thereafter, the skin was slightly showered. In this case, circulation of the blood was improved by heat generation due to hydration of the product with the moisture content on the skin, and non-greasy and smooth feeling was given.

5 EXAMPLE 7

1,3-Butylene glycol (21.2 parts), 30.0 parts of poly(ethylene glycol)-600 and 25.0 parts of propylene glycol were mixed, to which hydroxypropyl cellulose was added, and the mixture was further mixed with heating at 80 - 85°C. Under this temperature condition, ethylene glycol distearate was added, and the resulting mixture was then cooled to 40 - 45°C. Further, 15.0 parts of ethanol and 3.0 parts of 2-hexyl decanol were added. After the mixture was allowed to stand at room temperatures, 2.5 parts of isopropyl myristate, 0.2 parts of white pigment (Natural Pearlessence AH-1 supplied by Kakuhachi Co., Ltd.) and 0.1 part of purified water were further added to the mixture and uniformly mixed to obtain a moisturizing cream in a paste form.

20 An adequate quantity of the cream was taken in a hand, applied to and spread over skin which had been previously wetted with water, in a manner of massage. The skin was then slightly rinsed with water. In this case, comfortable hot feeling was given, and circulation of the blood was facilitated, and further good balance of the moisture content and oil content was achieved so that the skin became smooth.

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EXAMPLE 8

While poly(ethylene glycol)-300 (58.50 parts) and 26.45 parts of hexylene glycol were agitated in a batch, 1.50 parts of hydroxypropyl cellulose was added, and the mixture was then completely dissolved by heating at 80 - 85°C. 4.00 parts of cetyl trimethyl ammonium chloride (Lepon TM 16 supplied by Sanyo Kasei Co.) was added to and dissolved in the solution which was being cooled. Further, 3.00 parts of isopropyl myristate, 5.00 parts of oleyl alcohol and 1.00 part of hydrolyzed animal protein derivative (Promois E 118D supplied by Seiwa Kasei Co.) were added and made uniform. The resultant was allowed to stand at 45°C, and 0.05 parts of menthol, 0.50 parts of perfume (JN 333 supplied by Hasegawa Koryo K.K.) and an aqueous solution of an adequate amount of coloring matter (Yellow 4, Blue 1) in 0.10 part of purified water was added and made uniform to obtain a hair treatment. Trial tests of this hair treatment were conducted by standard methods applying it to ten housewives. As a result, the ten housewives observed that the hair treatment did not require steaming operation due to adequate heat generation and it was less sticky than the conventional cream type product and further showed moist and supple finishing effect.

EXAMPLE 9

A hair treatment was prepared by using the same recipe as in Example 8 except that the poly (ethylene glycol) was

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1 replaced by 50.00 parts of poly(oxyethylene)-poly(oxypropylene)
butylether and the hexylene glycol alone was replaced by 20.00
parts of hexylene glycol and 19.40 parts of 1,3-butylene glycol
in combination and further the oleyl alcohol was replaced by
5 3.00 parts of hexyl decanol. This hair treatment showed the
same finishing effect as that obtained by the product of
Example 8.

EXAMPLE 10

10 Poly(oxyethylene)-poly(oxypropylene) butylether (44.2
parts), 20.0 parts of poly(ethylene glycol)-300, 25.0 parts
of hexylene glycol, 1.0 parts of camellia oil, 3.0 parts of
isopropyl myristate, 4.0 parts of 2-hexyl decanol, 1.2 parts
of behenyl trimethyl ammonium chloride, 1.0 parts of hydrolyzed
animal protein derivative (Promois E 118D supplied by Seiwa
15 Kasei Co.), 0.5 parts of perfume and 0.1 part of purified
water were successively mixed uniformly to obtain a hair oil
rinse in a liquid form.

20 An adequate quantity of the hair oil rinse was applied
to hair which had been shampooed, and uniformly spread in a
manner of massage together with water in an about equivalent
amount to that of the oil rinse. The hair was then washed
with water. As a result, hydration of the oil rinse spon-
taneously generated heat, gave comfortable hot feeling effect
and improved circulation of the blood in the root of the hair.

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1 WHAT WE CLAIM IS:

1. A cosmetic composition which comprises a compound
capable of generating heat to raise the temperature of the
composition when the compound is brought into contact with
5 water.

2. A cosmetic composition according to Claim 1 in which
the compound causes a temperature rise of not less than 3°C
when the compound is mixed with an equivalent weight of water.

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3. A cosmetic composition according to Claim 1 or 2 in
which the compound is contained in an amount of 50 - 95% by
weight based on the total cosmetic composition.

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4. A cosmetic composition according to Claim 1 or 2
in which the compound is a member selected from the group
consisting of alkyl alcohols having 2 to 4 carbon atoms,
alkylene glycols having 2 to 9 carbon atoms in the alkylene
portion, glycerol, di(alkylene glycols) and derivatives thereof
20 having 2 to 4 carbon atoms in the alkylene portion, and poly
(alkylene oxides) and derivatives thereof having 2 to 4 carbon
atoms in the alkylene portion.

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5. A cosmetic composition according to Claim 4, in which
the derivatives of the di(alkylene glycols) are alkyl mono

1 ethers of the di(alkylene glycols) having 1 to 5 carbon atoms
in the alkyl portion.

5 6. A cosmetic composition according to Claim 4, in which
the derivatives of the poly(alkylene oxides) are alkyl mono
ethers of the poly(alkylene oxides) having 1 to 5 carbon atoms
in the alkyl portion.

10 7. A cosmetic composition according to Claim 4, in which
the derivatives of the poly(alkylene oxides) are the poly
(alkylene oxide) adducts of glycerol.

15 8. A cosmetic composition according to Claim 1 or 2 in
which both a member selected from the group consisting of poly
(ethylene oxides), poly(propylene oxides) and derivatives
thereof and a member of alkylene glycols having 2 to 9 carbon
atoms are contained as the compound.

20 9. A cosmetic composition according to Claim 8 in which
the former member is contained in an amount of 50 - 90% by
weight based on the total cosmetic composition and the latter
member is contained in an amount of 0.1 - 1.0 part by weight
per one part by weight of the former member, the sum of the
former member and the latter member being not more than 100%.

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10. A cosmetic composition according to Claim 8, in which the derivatives of the poly(ethylene oxides) and poly(propylene oxides) are alkyl mono ethers of the poly(ethylene oxides) and poly(propylene oxides) having 1 to 5 carbon atoms in the alkyl portion.

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11. A cosmetic composition according to Claim 8, in which the derivatives of the poly(ethylene oxides) and poly(propylene oxides) are poly(ethylene oxides)-, poly(propylene oxides)- or poly(ethylene oxide and propylene oxide)- adducts of glycerol.

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12. A cosmetic composition according to Claim 8 or 9 which is used as a conditioning cosmetic composition for hair.

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13. A cosmetic composition according to Claim 1, 2, 3 or 4 which is used for hair shampoo, hair rinse, hair treatment or hand cleaner.

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⑤4 **A cosmetic composition.**

⑤7 A cosmetic composition comprises a compound capable of generating heat to raise the temperature of the composition when the compound is brought into contact with water.

The cosmetic composition is used for hair shampoo, hair rinse, hair lotion, hair treatment, hand cleaner, hand lotion, cleansing lotion and moisturizing cream.

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	<p>GB - A - 1 042 529 (AMERICAN HOME PRODUCTS)</p> <p>* Page 1, lines 12-20 and 50-68; page 2, line 85 - page 3, line 8; page 4, lines 49-62; example 8; claims 1,6,8,15, 16,19-23 *</p> <p>--</p>	1-4, 13	A 61 K 7/00 7/48
X	<p>US - A - 3 250 680 (J. MENKART et al.)</p> <p>* Column 1, lines 8-20 and line 55 - column 2, line 12; examples 1,4,8,9,10; claims *</p> <p>--</p>	1-4, 13	TECHNICAL FIELDS SEARCHED (Int. Cl.) A 61 K 7/00 7/09 7/15 7/15b
X	<p>US - A - 3 723 324 (V.J. PIERCE et al.)</p> <p>* Column 2, lines 14-27; column 3, lines 7-55; example 1; claim 1 *</p> <p>--</p>	1-3, 13	
X	<p>GB - A - 1 357 000 (BRITISH-AMERICAN TOBACCO CY)</p> <p>* Page 1, lines 40-54, 68 - page 2, line 47; page 2, lines 67-90; examples; claims *</p> <p>----</p>	1-4, 13	CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
<p>X The present search report has been drawn up for all claims</p>			<p>&: member of the same patent family. corresponding document</p>
Place of search		Date of completion of the search	Examiner
28-07-1981		28-07-1981	WILLEKENS

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